

9. The generator of claim 1 wherein the polymer has a maximum linear strain of at least about 50 percent.

10. The generator of claim 9 wherein the polymer has a maximum linear strain of at least about 100 percent.

11. The generator of claim 1 wherein the polymer has a maximum area strain of at least about 100 percent.

12. The generator of claim 1 wherein the pre-strain is applied to a first orthogonal direction at a pre-strain greater than pre-strain in a second orthogonal direction.

13. The generator of claim 12 wherein the pre-strain applied to the first orthogonal direction is used to enhance the change in electric field from a deflection in the second orthogonal direction.

14. The generator of claim 12 wherein the polymer is pre-strained by a factor in the range of about 1.5 times to 50 times an original area prior to pre-strain.

15. The generator of claim 1 further comprising an electric circuit electrically coupled to the at least two electrodes.

16. The generator of claim 1 wherein the polymer comprises a material selected from the group consisting of silicone elastomer, acrylic elastomer, polyurethane copolymer comprising PVDF, and combinations thereof.

17. The generator of claim 1 wherein the polymer can support a change in electric field at most about 440 MegaVolts/meter.

18. The generator of claim 1 wherein electrical energy generated by deflection of the polymer generates at least about 0.15 Joules per gram for the polymer.

19. The generator of claim 1 wherein the generator is used in a heel strike generator.

20. The generator of claim 1 wherein one of the at least two electrodes is compliant.

21. A generator for converting mechanical energy to electrical energy, the generator
5 comprising:

at least two electrodes; and

a polymer having a substantially constant thickness and an area orthogonal to the
thickness, the polymer arranged in a manner which causes a change in electric field in
response to a net area decrease of the polymer for the area orthogonal to the thickness.

22. The generator of claim 21 wherein the generator is stretched before the change in
electric field.

23. The generator of claim 22 wherein the at least two electrodes apply a voltage that
15 produces a pressure in the polymer less than the elastic restoring forces resulting from the
stretch.

24. A generator for converting from electrical energy to mechanical energy, the generator
20 comprising:

at least one transducer, each transducer comprising:

at least two electrodes, and

a polymer arranged in a manner which causes a change in electric field in
response to a deflection applied to a first portion of the polymer; and

25 a frame attached to a second portion of the polymer, the frame comprising at least
one aperture, wherein the first portion of the polymer is arranged in a manner which causes a
change in electric field in response to a deflection applied to a third portion of the polymer.

30 25. The generator of claim 24 wherein the transducer is stretched before deflection of the
third portion of the polymer.

